

Remarks

Support for the above-requested amendments to claims 1, 15, and 21 is found at least on page 7, lines 1-3, 14-16, and 35-37. Claims 1-23 have been amended for various grammatical reasons and/or to place the claims in U.S. format. Claims 24 and 25 have been canceled without prejudice. The Abstract has been amended to place it in proper U.S. format. No question of new matter arises and entry of the above-requested amendments is respectfully requested.

Claims 1-23 are before the Examiner for consideration.

Objection to the Specification

The specification has been objected to because the trademarks contained therein are not accompanied by generic terminology. In response, Applicants respectfully request that this objection be held in abeyance until the indication of allowable subject matter.

Claim Objections

Claims 5-25 have been objected to as being in improper form. In particular, the Examiner asserts that the claims contain multiple dependent claims that depend upon other multiple dependent claims. As a result, claims 5-25 have not been treated on the merits.

In response, Applicants have amended claims 5-25 to remove the multiple claim dependencies. Additionally, claims 5-25 have been amended to correct inadvertent grammatical errors and/or to place the claims into proper U.S. format.

In view of these amendments, Applicants respectfully request that this objection be withdrawn and that claims 5-25 be examined on the merits.

Rejection under 35 U.S.C. §112, second paragraph

Claims 3 and 4 have been rejected under 35 U.S.C. §112, second paragraph, as being indefinite. In particular, the Examiner asserts that in claim 3, the use of parentheses in the phrases “polycarboxylic acid(s)”, “anhydride(s)”, and “polyol(s)” create ambiguity in the claim and make it difficult to determine the metes and bounds for which patent protection is sought. With respect to claim 4, the Examiner asserts that the phrase “such as” renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention.

In response to this rejection, Applicants have amended claim 3 to remove the parentheses from the claim and to recite that the polyester is obtained "by reaction of a member selected from polycarboxylic acid, an anhydride of polycarboxylic acid and mixtures thereof and a polyol". Regarding claim 4, Applicants have amended the claim to remove all phrases beginning with "such as".

In view of the above, it is respectfully submitted that as amended, claims 3 and 4 are sufficiently definite. Accordingly, Applicants respectfully request that this rejection be reconsidered and withdrawn.

Rejection under 35 U.S.C. §102(b)

Claim 1 has been rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,670,255 to Temple, *et al.* ("Temple") and U.S. Patent No. 5,824,413 to Schell ("Schell"). In particular, the Examiner asserts that Temple teaches a glass strand coated with an aqueous composition that includes film formers such as polyesters, polyurethanes, vinyl polymers, and mixtures thereof. In addition, it is asserted that Temple teaches that the vinyl polymer can be polyvinyl acetate.

With respect to Schell, the Examiner asserts that Schell teaches glass strands coated with an aqueous composition that includes a polyurethane. It is also asserted that Schell teaches that additional film formers such as polyester and vinyl polymers can be present in the composition. Further, the Examiner asserts that the vinyl polymer can be polyvinyl acetate.

In view of these teachings in Temple and Schell, the Examiner concludes that both Temple and Schell anticipate the claimed invention.

Applicants' Response

In response to this rejection, Applicants respectfully direct the Examiner's attention to the amendments made to independent claim 1 and submit that claim 1 defines a glass strand that is not taught (or suggested) by either Temple or Schell. It is respectfully submitted that although Temple and Schell generally and generically disclose the inclusion of film formers such as polyester, polyurethane, and polyvinyl acetate in a coating composition, there is no teaching (or suggestion) within Temple or Schell of a sizing composition for glass strands that includes 50 to 80% of at least one polyester, 10 to 40% of at least one polyvinyl acetate, and 8 to 15% of at least one polyurethane as required by claim 1. Indeed, both Temple and

Schell are silent with respect to any teaching (or suggestion) of the selection of these particular film formers or the claimed amounts of these specific film formers within the sizing composition. It is respectfully submitted that Temple and Schell simply do not teach (or suggest) the claimed sizing composition claimed in claim 1.

As is well established, in order for a reference to be anticipatory, each and every element of the claimed invention must be found within the four corners of the cited reference. Because neither Temple nor Schell teaches a sizing composition for glass strands that includes 50 to 80% of at least one polyester, 10 to 40% of at least one polyvinyl acetate, and 8 to 15% of at least one polyurethane as required by claim 1, Applicants submit that Temple and Schell are not anticipatory references. Accordingly, Applicants submit that independent claim 1, and all claims dependent therefrom, are not anticipated by Temple or Schell. Reconsideration and withdrawal of this rejection is respectfully requested.

Rejection Under 35 U.S.C. §103(a)

Claims 2-4 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,670,255 to Temple, *et al.* ("Temple") and U.S. Patent No. 5,824,413 to Schell ("Schell"), each as applied to claim 1 above, and each in view of U.S. Patent Publication No. 2004/0265586 to Gonthier, *et al.* ("Gonthier"). The Examiner admits that Temple and Schell fail to teach the specific formation of the polyester polymer or its molecular weight. In this regard, Gonthier is cited for assertedly teaching glass strands coated with an essentially aqueous sizing composition that includes a polyurethane and a polyester. It is asserted that the polyester is produced by the reaction of a carboxylic acid and/or anhydride and a polyol as is required by claim 3. Additionally, the Examiner asserts that the polyol can be a polyalkylene glycol and the anhydride can be maleic anhydride as required by claim 4. The Examiner concludes that it would have been obvious to one of skill in the art to use as the polyester of Temple or Schell a polyester that is produced by the reaction product of a carboxylic acid or anhydride with a polyol as is taught by Gonthier.

In addition, the Examiner admits that Gonthier is silent with respect to the specific molecular weight of the polyester. However, it is the Examiner's position that where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation. The Examiner therefore concludes

that the combined teachings of Temple or Schell with Gonthier would have rendered the subject matter of claims 2-4 obvious.

Applicants' Response

In response to this rejection, Applicants respectfully direct the Examiner's attention to the amendments made to independent claim 1 and submit that claim 1 defines a glass strand that is not taught or suggested by Temple, Schell, and Gonthier. In addition, Applicants respectfully submit that Temple, Schell, and Gonthier do not teach or suggest the combination of features recited in claim 1.

Applicants respectfully submit that none of Temple, Schell, or Gonthier teaches or suggests a glass strand coated with an aqueous sizing composition that includes 50 to 80% of at least one polyester, 10 to 40% of at least one polyvinyl acetate, and 8 to 15% of at least one polyurethane as required by claim 1. Looking first at Temple, Temple teaches that in one embodiment, the aqueous curable composition can include a film forming material in addition to the antioxidant. (*See, e.g.*, column 2, lines 14-21 and the Abstract). Non-limiting examples of suitable film forming materials include starches, cellulosic materials, thermoplastic materials, thermosetting materials, and mixtures thereof. (*See, e.g.*, column 15, lines 39-42). Temple goes on to further teach various examples for each of the potential film forming materials at least from line 44 of column 15 to line 67 of column 17.

Applicants acquiesce that there is a general disclosure within Temple of a polyester, a polyurethane, and polyvinyl acetate; however, one of skill in the art would have no reason, based on the teachings of Temple, to choose these three particular film forming materials from the extensive list of film forming agents recited in Temple for use in a sizing composition for glass strands. Applicants respectfully submit that polyester, polyurethane, and polyvinyl acetate cannot simply be selected from an extensive list of potential film formers without some suggestion or motivation provided within the reference for one of skill in the art to select the particular components. It is submitted that simply placing polyesters, polyurethanes, and polyvinyl acetate in a list of potential film forming materials does not provide motivation for one of skill in the art to choose one particular polymer over another. (*See, e.g., Manual of Patent Examining Procedure*, Patent Publishing, LLC, Eighth Ed., Rev. 6, August 2007, §2144.08). Indeed, polyesters, polyurethanes, and polyvinyl acetate are cited in the exemplary and extensive list of film formers in Temple without any teaching of desired or advantageous features that may be or are provided by selecting and utilizing polyesters,

polyurethanes, and polyvinyl acetate, especially when they are used in combination as is required by claim 1. Polyesters, polyurethanes, and polyvinyl acetate are merely cited as examples within a large number of film formers for use in an alternate embodiment of Temple. One of skill in the art has no reason to select a polyester, a polyurethane, and a polyvinyl acetate as a film forming material based on the disclosure of Temple. Gonthier teaches the use of a polyurethane and a polyester in a sizing composition in a specific ratio, and does not mention the use of polyvinyl acetate. Thus, Gonthier does not provide any assistance to one of skill in the art to arrive at the glass strand of claim 1. Accordingly, it is respectfully submitted that claim 1 is non-obvious and patentable for at least this reason.

In addition, Applicants submit that there is no teaching or suggestion of the claimed ranges for each of the polyester, polyurethane, and polyvinyl acetate recited in claim 1. Indeed, Temple is silent as to any teaching or suggestion of specific ranges for a polyester, a polyurethane, and polyvinyl acetate. Applicants note that Temple teaches that the total amount of film forming material can be about 0.0001 to about 99.1 weight percent of the curable composition on a solids basis. (*See, e.g.*, column 18, lines 1-2). Temple further teaches that a preferred range is from about 0.01 to about 50 weight percent, and even more preferably, from about 0.01 to about 10 weight percent. (*See, e.g.*, column 18, lines 3-5). It is respectfully submitted that a teaching "from about 0.0001 to 99.1 weight percent" is simply not a sufficient teaching for one of skill in the art to arrive at the claimed ranges for the polyester, polyurethane, and polyvinyl acetate.

Moreover, Applicants respectfully submit that the claimed ranges cannot be obtained by routine experimentation given the vast array of film formers listed and the virtual endless combination of ranges possible for each film former. Applicants have surprisingly discovered that the use of at least one polyurethane, at least one polyester, and at least one polyvinyl acetate within the claimed amounts provide for better cutting of the glass strand, even compared to when only two of the film forming agents were used. (*See, e.g.*, page 20, lines 26-30 of the present specification). Further, Applicants have discovered that if a polyvinyl acetate is used in an amount less than 10 weight percent, the ability of the strands to be cut is not satisfactory. (*See, e.g.*, page 7, lines 14-20 of the present specification). Additionally, it has been discovered that when greater than 40 weight percent polyvinyl acetate is used, impregnation of the glass strands is inadequate. (*Id.*). Gonthier does not teach or suggest the claimed ranges, and as such, cannot make up for the deficiencies of

Temple. Therefore, it is submitted that the combination of Temple and Gonthier would not result in the glass strand of claim 1. Accordingly, it is respectfully submitted that claim 1 is non-obvious and patentable for this additional reason.

In addition, Applicants respectfully submit that Temple teaches away from the claimed amounts for each of the film forming agents. In Temple, the preferred ranges for the total amount of film forming materials are from about 0.01 to about 50 weight percent, and from about 0.01 to about 10 weight percent. (*See, e.g.*, column 18, lines 3-5). These ranges may be contrasted to the claimed ranges, where, at a minimum, the film forming agents are present in the sizing composition in an amount of 68% by weight of the solid material (*i.e.*, 50% polyester + 10% polyvinyl acetate + 8% polyurethane). In Temple, the film former is preferably present in an amount less than 50 weight percent. Applicants respectfully submit that such a teaching within Temple would lead one of skill in the art away from ranges that would create a film forming material that is present in an amount greater than 50 weight percent, such as is claimed in claim 1.

In addition, Applicants submit that there is no motivation for one of skill in the art to arrive at the glass strand claimed in claim 1 based on the disclosures of Temple and Gonthier. To establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, and the prior art reference (or references when combined) must teach or suggest all the claim limitations. (*See, e.g., Manual of Patent Examining Procedure*, Patent Publishing, LLC, Eighth Ed., Rev. 7, August 2008, §2143 citing *KSR International Co. v. Teleflex Inc.*, 550 U.S.398, 82 USPQ2d 1385 (2007)).

It is respectfully submitted that one of ordinary skill in the art would not be motivated to arrive at a glass strand coated with an aqueous sizing composition that includes 50 to 80% of at least one polyester, 10 to 40% of at least one polyvinyl acetate, and 8 to 15% of at least one polyurethane based on the teachings of Temple and Gonthier because there is simply no teaching or even a suggestion within Temple or Gonthier of the inclusion of the claimed film forming agents in the claimed amounts in a sizing composition for a glass strand, as is discussed in detail above. Without some teaching or suggestion, there can be no motivation, and without motivation, there can be no *prima facie* case of obviousness.

With respect to Schell, Applicants respectfully submit that Schell teaches an aqueous secondary coating composition adapted to coat a fiber strand having thereon a sizing composition. (See, e.g., column 3, lines 1-4 and the Abstract). The secondary coating composition includes one or more urethane polymers as a film forming material in an amount from about 1 to about 60 wt% of the secondary coating composition on a total solids basis. (See, e.g., column 3, lines 50-53 and column 5, lines 4-8). Schell teaches that the aqueous secondary coating composition may also include one or more film forming materials. (See, e.g., column 8, lines 25-28). These film forming materials may be present in an amount from about 1 to about 20 weight percent of the aqueous secondary coating composition on a total solids basis. (See, e.g., column 9, lines 52-55).

These teachings of Schell may be contrasted to the claimed invention where the film forming adhesion agents of the sizing composition include 50 to 80% of at least one polyester, 10 to 40% of at least one polyvinyl acetate, and 8 to 15% of at least one polyurethane. Assuming, *arguendo*, that the additional film forming materials of Schell include a polyester and a polyvinyl acetate, there is no way that Schell can include a polyester in an amount from 50 to 80% by weight of the total solids as is required by claim 1. Indeed, Schell specifically teaches that the other film forming agents (*i.e.*, film formers other than polyurethane) are present in the composition in an amount from about 1 to about 20%. There is simply no teaching or suggestion anywhere within Schell of including a polyester in an aqueous sizing composition in an amount from 50 to 80% by weight as claimed in claim 1. Gonthier does not teach or suggest the claimed ranges for the claimed film formers, and as such, cannot make up for the deficiencies of Schell. Accordingly, it is respectfully submitted that the combination of Schell and Gonthier would not result in the glass strand claimed in claim 1. Therefore, Applicants respectfully submit that claim 1 is non-obvious and patentable.

Further, Applicants submit that there is no motivation for one of skill in the art to arrive at the glass strand claimed in claim 1 based on the disclosures of Schell and Gonthier. As discussed above, to establish a *prima facie* case of obviousness, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, and the prior art reference (or references when combined) must teach or suggest all

the claim limitations.¹ It is respectfully submitted that one of skill in the art would not be motivated to arrive at the claimed glass strand at least because neither Schell nor Gonthier teaches or suggests a sizing composition that includes 50 to 80% of at least one polyester, 10 to 40% of at least one polyvinyl acetate, and 8 to 15% of at least one polyurethane. Indeed, based on the teachings of Schell, it is impossible to include a polyester in an amount of 50 to 80% in the secondary coating of Schell. Without some teaching or suggestion, there can be no motivation, and without motivation, there can be no *prima facie* case of obviousness.

In addition, because Schell and Gonthier do not teach or suggest a sizing composition that includes 50 to 80% of at least one polyester, 10 to 40% of at least one polyvinyl acetate, and 8 to 15% of at least one polyurethane, Applicants respectfully submit that Schell and Gonthier, alone or in combination, fail to teach all of the claim limitations set forth in claim 1. Therefore, it is submitted that a *prima facie* case of obviousness has not been established for this additional reason.

In view of the above, it is respectfully submitted that independent claim 1 is not taught or suggested by Temple and Gonthier or Schell and Gonthier and that claim 1 is therefore non-obvious and patentable. With respect to dependent claims 2-4, Applicants submit that because independent claim 1 is not taught or suggested by Temple and Gonthier or Schell and Gonthier and because claims 2-4 are dependent upon claim 1 and contain the same elements as claim 1, dependent claims 2-4 are also not taught or suggested by Temple and Gonthier or Schell and Gonthier.

In light of the above, Applicants submit that 2-4 are not obvious over Temple and Gonthier or Schell and Gonthier and respectfully request that the Examiner reconsider and withdraw this rejection.

Conclusion

In light of the above, Applicants believe that this application is now in condition for allowance and therefore request favorable consideration.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

¹ See, e.g., *Manual of Patent Examining Procedure*, Patent Publishing, LLC, Eighth Ed., Rev. 7, August 2008, §2143 citing *KSR International Co. v. Teleflex Inc.*, 550 U.S.398, 82 USPQ2d 1385 (2007).

If necessary, the Commissioner is hereby authorized to charge payment or credit any overpayment to Deposit Account No. 50-0568 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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